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United States
Department of
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Animal and
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Veterinary
Services

Vaccination Practices for Respiratory Pathogens in U.S. Feedlots

National Animal Health Monitoring System

Vaccination is one of several health management practices available to feedlot operators to decrease risk of disease impacting animal performance in the feedlot. Vaccination can be viewed as part of an overall health management program that includes, among other factors: nutrition, handling, facilities, and pre-arrival management.

In the fall of 1994, the USDA's National Animal Health Monitoring System (NAHMS) contacted producers with feedlots of less than 1,000 head capacity by telephone and visited producers with larger feedlots from the 13 primary cattle feeding states.¹ The cattle inventory in the 13 states was approximately 85 percent of the national inventory as of January 1, 1994, and the 13 states fed in excess of 85 percent of the total cattle fed for harvest in the United States. Large-capacity operations comprised 4 percent of feedlots, but accounted for 83.3 percent of total feedlot inventory for the 13 states as of January 1, 1994. During the Cattle on Feed Evaluation (COFE), 913 small-capacity and 453 large-capacity feedlot producers responded to interview questions

about operation management and health of their animals. Results were weighted to represent all small and large feedlots from the 13 states.

Producers were asked about vaccination practices for cattle placed on feed in their operation over a period from July 1, 1993, through June 30, 1994.

Vaccination practices for respiratory pathogens while in the feedlot varied by feedlot size and region (Table 1). Less than one-half of smaller feedlots (less than 1,000 head, one-time capacity) vaccinated for each respiratory pathogen. Nearly all (95-100 percent) of larger feedlots vaccinated cattle for infectious bovine rhinotracheitis (IBR). Most large feedlots (75 to 89 percent) also vaccinated for other viral causes of respiratory disease in cattle. Vaccination for bacterial causes of respiratory disease (*Pasteurella* spp. and *Hemophilus somnus*) were used much less frequently than viral antigens in all sizes of feedlots.

Table 1 shows vaccination for respiratory pathogens was used by less than 50 percent of

Table 1

Percent of Operations Vaccinating Cattle Placed on Feed for Various Antigens by Herd Size and Region

		Feedlot Capacity (Head)			Feedlot Location				
		Less Than 1,000	1,000 or More			West	Central	Midwest	South Central
			Annual Number of Placements						
Antigen		Less Than- 10,000	10,000- 39,999	40,000+					
Bovine viral diarrhea virus (BVD)	43.7	88.7	86.0	82.5	46.3	31.4	49.3	74.0	
Infectious bovine rhinotracheitis (IBR)	46.2	94.8	96.4	100.0	48.8	43.6	48.4	80.6	
Parainfluenza Type 3 (PI3)	36.3	87.2	84.3	79.8	32.2	30.1	39.8	75.1	
Bovine Respiratory Syncytial Virus (BRSV)	33.5	85.8	81.5	75.3	43.3	24.9	37.8	70.5	
<u>Hemophilus somnus</u>	28.6	60.9	57.0	48.0	33.8	21.6	31.1	64.2	
<u>Pasteurella</u> spp.	28.4	45.8	55.7	58.0	29.7	19.6	30.7	66.6	

*Regions were defined as: WEST - Arizona, California, Idaho, and Washington. CENTRAL - Kansas, Nebraska, and South Dakota. MIDWEST - Iowa, Illinois, and Minnesota. SOUTH CENTRAL - Colorado, Oklahoma, and Texas.

1 Arizona, California, Colorado, Idaho, Illinois, Iowa, Kansas, Minnesota, Nebraska, Oklahoma, South Dakota, Texas, and Washington.

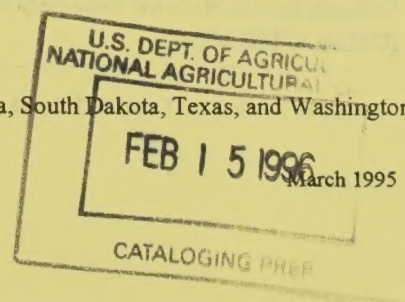


Table 2

Percent of Cattle on Feed Vaccinated for Various Antigens by Herd Size and Region*

Antigen	Less Than 1,000	Feedlot Capacity (Head)			Feedlot Location			
		1,000 or More			West	Central	Midwest	South Central
		Annual Number of Placements						
		Less Than- 10,000	10,000- 39,999	40,000+				
Bovine viral diarrhea virus (BVD)	61.5	86.5	75.5	78.8	76.4	92.4	71.4	62.6
Infectious bovine rhinotracheitis (IBR)	65.2	95.4	95.4	99.7	99.1	94.3	75.3	97.7
Parainfluenza Type 3 (PI3)	51.5	83.9	67.7	74.5	67.2	78.4	66.4	66.3
Bovine Respiratory Syncytial Virus (BRSV)	46.2	83.7	62.6	55.7	57.4	71.8	61.4	47.1
<u>Hemophilus somnus</u>	39.3	46.6	39.5	22.0	41.5	30.5	47.9	25.1
<u>Pasteurella spp.</u>	36.4	29.5	26.8	32.2	55.7	17.6	38.2	37.4

*Regions were defined as: WEST - Arizona, California, Idaho, and Washington. CENTRAL - Kansas, Nebraska, and South Dakota. MIDWEST - Iowa, Illinois, and Minnesota. SOUTH CENTRAL - Colorado, Oklahoma, and Texas.

feedlots in all regions with the exception of the south central United States. This result was likely due to the predominance of larger feedlots in the south central region compared to other regions.

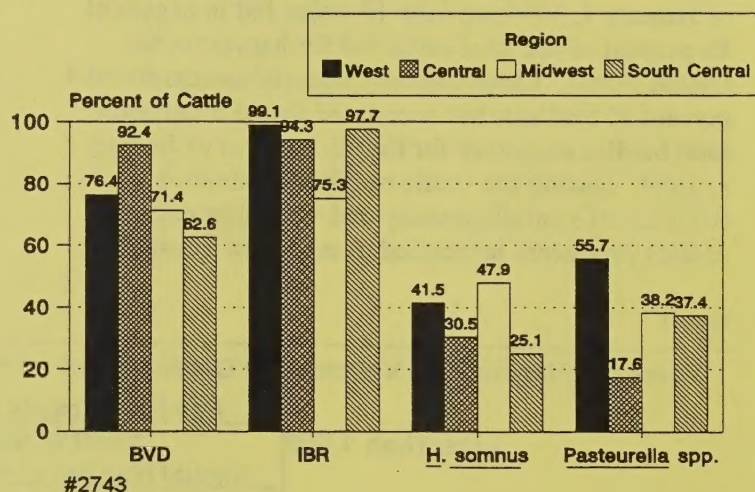
The percentage of cattle placed on feed that were vaccinated for viral causes of respiratory disease by feedlot size showed similar trends as with the percent of feedlots vaccinating (Table 2 and Figure 1). On a regional basis, the percentage of cattle vaccinated for respiratory pathogens was, in general, higher than the percentage of operations vaccinating because larger feedlots placed more cattle on feed and were more likely to vaccinate. In the midwest, a higher proportion of the cattle placed were placed in smaller feedlots, and thus, the smaller percentage of animals vaccinated for respiratory viruses in that region compared to the others.

In summary, vaccination for viral pathogens of the respiratory system was common, especially among larger feedlots. However, for most regions and feedlot sizes, less than one-half of cattle placed were vaccinated for bacterial respiratory pathogens.

NAHMS collaborators included the National Agricultural Statistics Service (USDA), State and Federal Veterinary Medical Officers, and the National Veterinary Services Laboratories (USDA:APHIS:VS).

Figure 1

Percent of Cattle Vaccinated for Selected Pathogens by Region



Other COFE information is available on the following topics: Branding, Mexican-origin cattle, environmental management, injection practices, and information sources. Study results on beef cow/calf, dairy cattle, and swine are also available. For more information contact:

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Injection Practices in Large Feedlots

National Animal Health Monitoring System

Injection site lesions continue to be of great concern to the beef industry. On-going surveys of top sirloin butts would indicate that progress has been made in eliminating lesions from this cut of meat (Figure 1). Feedlot operators have responded significantly to the message of quality assurance in beef production, particularly with respect to injection practices.

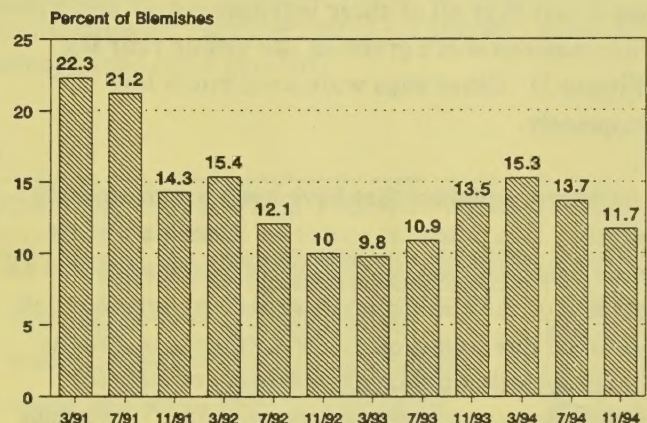
The USDA's National Animal Health Monitoring System (NAHMS) collected management information from feedlots with at least 1,000 head, one-time capacity in the 13 primary cattle feeding states¹. Over 85 percent of the January 1, 1994, inventory of cattle on feed for the United States were present in these 13 states. Though these large-capacity feedlots represented only 4 percent of all feedlots in the 13 states, they had 83.3 percent of the 13 states' January 1994 feedlot inventory. In October, November, and December of 1994, 453 feedlot operators provided information on health management practices for NAHMS' Cattle on Feed Evaluation (COFE). The results were weighted to represent all large (1,000 head or more capacity) feedlots in the 13 states.

Previous COFE information from feedlots in the same area showed that 83.1 percent of these large-capacity feedlots had changed their injection practices (location or route) in the past 5 years due to concerns about quality assurance or food safety. However, there is still room for improvement as the National Cattlemen's Association study of top sirloin butts would indicate.

Much concern about injection site lesions has centered around the use of clostridial vaccines, especially multivalent products. Most large feedlots (91.0 percent) vaccinated some cattle with a clostridial vaccine. Of all of the placements in large

Figure 1

Injection Site Damage in Beef Top Sirloin Butts



Source: National Cattlemen's Association

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feedlots between July 1, 1993, and June 30, 1994, 92.0 percent were reported to have received at least one clostridial vaccination. **Just over 23 percent of the cattle placed on operations using clostridial vaccines received more than one clostridial injection.** Multiple vaccinations (at the same time or at different times) may lead to more injection site lesions. Table 1 shows the primary clostridial organisms vaccinated against included Cl. perfringens type C and D (90.8 percent of cattle placed),

Table 1

Percent of Large Operations, and Percent of All Cattle Placed, Vaccinated for Various Clostridial Agents

Organism	Percent of:	
	Operations	Cattle Placed
<u>Cl. perfringens</u> C and D	89.7	90.8
<u>Cl. chauvoei</u>	88.6	84.0
<u>Cl. septicum</u>	87.5	82.8
<u>Cl. novyi</u>	86.0	82.8
<u>Cl. sordellii</u>	86.0	82.0
<u>Cl. hemolyticum</u>	35.2	31.9
<u>Cl. tetani</u>	16.7	4.0

¹ Arizona, California, Colorado, Idaho, Illinois, Iowa, Kansas, Minnesota, Nebraska, Oklahoma, South Dakota, Texas, & Washington.

Cl. chauvoei (84 percent), Cl. septicum, and Cl. novyi (both 82.8 percent).

Producers were asked about the route and location of clostridial injections. Only 13.8 percent of large feedlots that gave some clostridial vaccines did so in the muscle. For operations that used the intramuscular route for clostridial vaccination, 72.7 percent indicated that all intramuscular injections were given in the neck. **Another 18.4 percent of operations indicated that all of their intramuscular clostridial vaccinations were given in the upper rear leg** (Figure 2). Other sites were used much less frequently.

Other injectables that have been a concern to the industry as a potential source of lesions are some antibiotics and vitamins. Producers reported that 16.1 percent of the cattle placed on feed in large feedlots received one or more regular antibiotic injections (label specified effect was 24 hours or less) for prevention or treatment purposes, and 13.1 percent received long-lasting antibiotic injections (label specified effect was greater than 24 hours).

Most large feedlots (84.3 percent) that gave regular antibiotics indicated that some of the regular antibiotics were given intramuscularly. For operations using the intramuscular route, 12.8 percent indicated that all intramuscular injections were given in the upper rear leg. Over one-half (51.3 percent) indicated that all intramuscular injections were given in the neck. Many feedlots (62.8 percent) reported that some long-acting antibiotics were given in the muscle. Of those injecting in the muscle, 12.6 percent indicated all were given in the upper leg. Over one-half (57.9 percent) indicated all intramuscular injections were given in the neck.

Fifty-eight percent of large producers reported use of any vitamin injections. Overall, 44.3 percent of the cattle placed on feed received some sort of vitamin injection while they were on feed. The most commonly used vitamin injection was a combination of vitamins: A, D, and E (46.1 percent of operations and 42.5 percent of all cattle placed.)

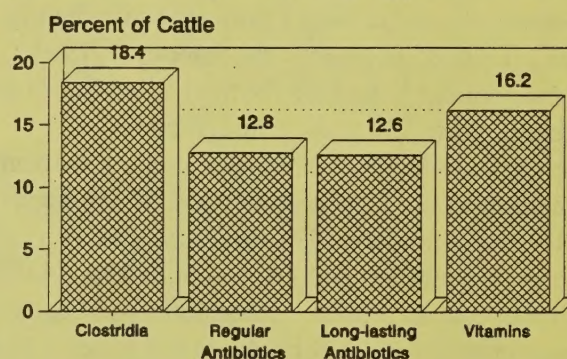
Over three-fourths (76.8 percent) of large feedlots giving vitamin injections gave some intramuscularly. Among the operations using the intramuscular route,

16.2 percent gave all intramuscular vitamin injections in the upper rear leg.

In summary, most operators of large feedlots have altered their injection practices in response to concern about beef quality. Still, there are a number of producers using products in ways that may lead to injection lesions. To some extent, this behavior is due to label clearances for specific products. However, the pharmaceutical and biologics industry is responding to the call for more products to be cleared for subcutaneous use and to document the lack of injection blemishes when used according to label indications. Together, beef producers and professionals allied to the beef industry can and will make progress in further improving beef quality.

Figure 2

Percent of Operations* Using the Upper Hip for All Intramuscular Injections by Type of Product



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*Of those operations (1,000 or more head capacity) using the intramuscular route.

NAHMS collaborators included the National Agricultural Statistics Service (USDA), State and Federal Veterinary Medical Officers, and the National Veterinary Services Laboratories (USDA:APHIS:VS).

Other COFE information is available on the following topics: Branding, Mexican-origin cattle, environmental management, vaccination practices, and information sources. Study results on beef cow/calf, dairy cattle, and swine are also available. For more information contact:

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The Veterinarian as an Information Source for Feedlot Operators

National Animal Health Monitoring System

Feedlot operators rely heavily on key individuals for the information they need to support decisions on animal health management, nutritional management, and general production. **One of the prominent figures recognized as a source of information is the veterinarian.**

The USDA's National Animal Health Monitoring System (NAHMS) collected management information from feedlots with at least 1,000 head one-time capacity in the 13 primary cattle feeding states¹. Over 85 percent of the January 1, 1994, inventory of cattle on feed for the U.S. were present in these 13 states. Though these large-capacity feedlots represented only 4 percent of all feedlots in these areas, they had 83.3 percent of the 13 states' January 1994 feedlot inventory. In October, November, and December of 1994, 453 feedlot operators provided information on health management practices for NAHMS' Cattle on Feed Evaluation (COFE). Analyses of these data incorporated the selection criteria and, thus, the results pertained to all large (1,000 head or more capacity) feedlots in the 13 states.

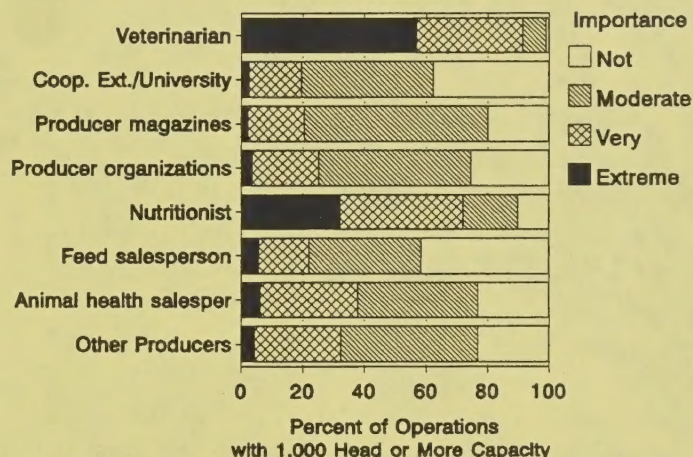
Producers were asked to rate the importance of various sources of information. Figure 1 shows that, in the area of animal health information, the veterinarian was most commonly cited as being very or extremely important (91.4 percent of producers.) Other highly important sources of animal health information were nutritionists (71.9 percent), animal health salespersons (37.8 percent), and other producers (32.3 percent).

Regarding sources of nutritional information, the nutritionist was the most commonly cited source as

being highly important (92.1 percent, Figure 2). Other sources less frequently cited as being highly important were veterinarians (41.2 percent) and feed salespersons (40.6 percent).

Figure 1

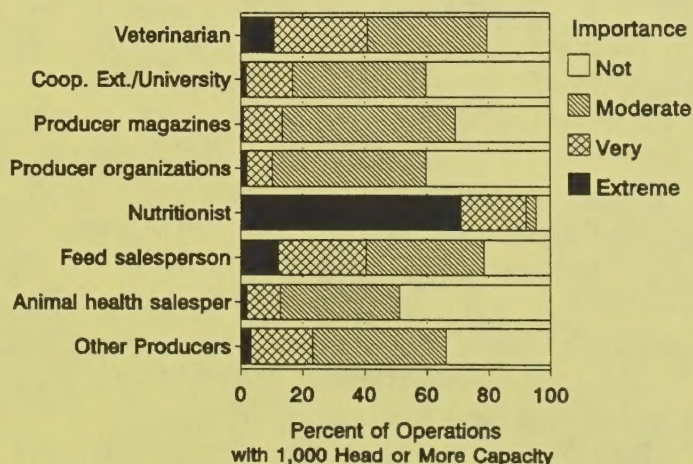
Sources of Animal Health Information



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Figure 2

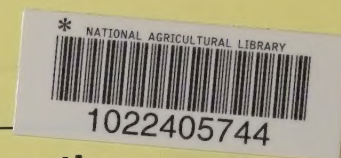
Sources of Nutritional Information



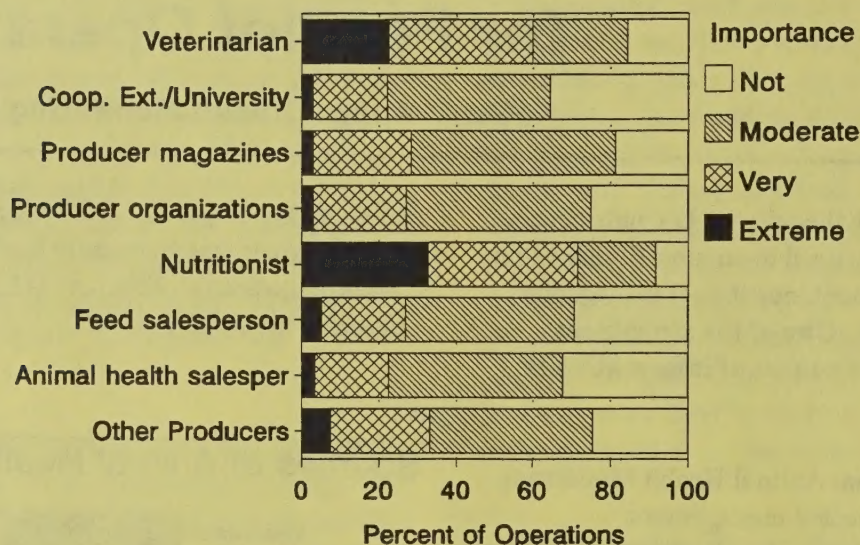
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1 Arizona, California, Colorado, Idaho, Illinois, Iowa, Kansas, Minnesota, Nebraska, Oklahoma, South Dakota, Texas, and Washington.

Figure 3



Sources of General Production Information



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Figure 3 shows that producers indicated a greater reliance on nutritionists (71.7 percent) as a highly important source of general production information than other sources such as the veterinarian (60.0 percent) and other producers (40.7 percent).

In summary, the veterinarian is a well respected source for animal health information. But, over two-thirds of operators of large feedlots had similar esteem for the nutritionist as a source of animal health information. Producers value veterinarians, but rely on them to a lesser extent for their nutritional information.

Over 20 percent of feedlot operators indicated that the veterinarian is not important as a source of nutrition information. Some would say that the veterinarian should be a more highly regarded source of information in the nutrition area, particularly since animal health and nutrition are integrally related. Perhaps lack of skills (perceived or real) in the area of nutrition is responsible for lack of reliance on the veterinarian for nutritional information.

While the veterinarian is a key player in the operation of large feedlots, opportunities exist for them to expand their influences. They could enhance services to feedlots through development of additional skills in nutrition and general production and by marketing those skills to feedlot operators so

that they are seen as an important source of information in areas other than animal health. In addition, the value placed on nutritionists as a source of information to feedlots underscores the need for veterinarians to develop alliances with these individuals to attain optimal herd health and feedlot profitability.

NAHMS collaborators included the National Agricultural Statistics Service (USDA), State and Federal Veterinary Medical Officers, and the National Veterinary Services Laboratories (USDA:APHIS:VS).

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